

A drawing correction has been submitted to identify the lower end of can 10 by the reference numeral 28. The upper or one end of the container is referred to by the reference numeral 27 as noted by the Examiner. The Examiner's approval of the drawing change is requested. It is noted that this correction will resolve the objection of paragraph 5 of the Office Action.

An abstract is being presented with the present amendment, the Abstract being submitted on a separate sheet.

The title of the invention has been amended to read "An Open Ended Container Closure Including A Flexible Membrane And A Rigid Cap".

The disclosure has been amended at page 11, lines 20-21 to correctly note that the threads 19 are formed on the body portion 13b of the can. It is submitted that the objections of paragraph 6 through 8 of the specification have been resolved.

Considering the specification objection of paragraph 9 of the Office Action, the substance of the originally filed Claim 7 has been added at page 12, second full paragraph. It is noted that the originally submitted claims are part of the specification disclosure and thus it is appropriate to copy the claim language verbatim into the written specification as proposed by the present amendment.

Similarly, the statement of Claim 13, part of the originally filed specification, has been restated at page 9, line 17. It is thus submitted that the antecedent basis for the claim subject matter is provided in the written specification, there being no new matter added since the originally filed claims contained these statements as part of the application specification.

Considering the objection of paragraph 10 of the Office Action, the description of the process on paragraphs 2 and 3 of page 11 is made more clear through the addition of the reference numeral 28 after "can end" in line 15. The open ended can 10 in accordance with the present invention is closed at the open end 27 by the flexible membrane and rigid cap closure "according to the invention" (page 11, line 13). The food is then added to the can from the bottom by conventional apparatus and "then a conventional can end 28 may be secured in a *per se* known manner" closing the can. This method and mode of operation is further supported by the following paragraph which states that before the cooking of the food products and preferably before the food products are placed in the can, the cap 12 is screwed onto the threads 19 of the body portion 13b which is overlying the membrane 11. It is thus respectfully submitted that the

disclosure is an adequate written description in pointing out that the food is added after the closure of the present invention has been added to the can, but before the can end 28 is applied by known means.

“Extension of the flexible member towards the laminar member” in former claim 7, now appearing in claim 1 refers to the extension of the flexible membrane under the action of internal pressure within the can during cooking as stated at page 12, lines 10-12. The presence of disc 21 prevents “rupture of membrane 11” at locations spaced from flange 18 even though there has been an extension of the flexible member under internal pressures toward the laminar member of, disc 21.

Considering now the claim rejections under 35 U.S.C. § 102, paragraphs 12 through 16 of the Office Action, it is noted that the present invention is particularly adapted for use in the continuous mass production of canned food products in which the food is placed within the cans in an uncooked or partially cooked state. Because food cooks in the cans, pressure builds up within the cans such that there is higher pressure within each can than outside the can. The problem that the present invention attempts to overcome is to prevent this internal pressure from blowing off the seal of an open end of the can. The mere presence of a resiliently deformable member would not necessarily achieve this aim.

An English translation of Japanese abstract 06219464 (Hiroshi) is enclosed for consideration of the significance of the reference. The plastic container of Hiroshi is used in the method, beginning at page 5, line 16, wherein cooked food product 9 is housed in the container body 1 and then the opening of the container body 1 is heat sealed with the inner lid 3. Thereafter the outer lid 5 is rotated onto the container to tightly fasten the inner lid 3 to the upper surface of the opening of the container. The specification then goes on to say that since the container formed with the lid as described, the inner lid 3 is tightly fastened by the outer lid 5 during retort sterilization treatment under high pressure and high temperature treatment. It appears from the description that the high temperature and pressure is applied externally of the container after the food has been placed within the container and lid 5 has been screwed down over the inner lid 3.

It is thus apparent, from the translation that this Japanese document discloses a container made from plastic in which *cooked* food is placed in the container prior to the sterilization process. In addition, although the packing 6 could be made of silicon rubber, there is no mention

nor suggestion of ensuring that the gap between the inner lid 3 and the outer lid 5 is less than the maximum possible extension of the flexible member 6. In other words, the container disclosed in the Japanese document has to withstand only pressure from the outside of the container and does not need to be able to withstand a build up of internal pressure to greater than atmospheric pressure.

The Examiner has also cited US Patent No. 3,833,142 (Owen) against the present invention. However, in Owen, the problem which the invention seeks to overcome relates to collapse of a container caused by a higher atmospheric pressure than the pressure within the container. Again the container disclosed in Owen is not designed to withstand the high temperatures and pressures necessary to cook food products within the container. The container is made from an easily deformable plastics material, and the problem is solved by insertion of a thin film of plastic which can deflect inwardly in order to compensate for higher pressures outside the container.

US Patent No. 4,531,649 (Shull) relates to a molded plastic cap having a sealing liner. The liner is very different to the pre-stressed flexible membrane as claimed in Claim 1 of the present application. In particular the liner of Shull would not be able to withstand the build up of pressure from within the container.

Similarly, the liner disclosed in GB 2,123,392 (Revill) would not be appropriate for withstanding a build up of internal pressure.

Claim 1 has been amended to include the substance of Claims 1, 2, 5 and 7 to more clearly define applicant's invention over the prior art. As noted earlier, applicant's invention is particularly adapted for use in the continuous mass production of canned food products in which the food is placed within the can in an uncooked or partially cooked state. Cooking of the food within the can produces substantial internal pressures which cause the flexible membrane to extend toward the rigid cap. As noted in applicant and as stated in Claim 1, the laminar member of the rigid cap is spaced from the flexible membrane by a distance less than the maximum possible extension of the resiliently deformable member toward the laminar member. When food is cooked within the closed and the membrane moves under the internal pressures in such a manner that, but for the presence of the cap, the membrane might rupture as discussed in the second paragraph on page 12 of the present application. This construction and mode of operation is not found in the prior art references when taken individually or in combination. It is

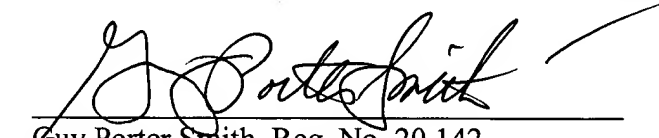
respectfully submitted that the pending set of claims are not anticipated by any of the references discussed in the office action paragraphs 12 through 16.

It is noted that the Examiner has rejected Claims 8 and 11 under the provisions of 35 USC § 103 relying upon the Hiroshi reference as the primary reference. The primary reference does not disclose the use of a foamed material for the resilient seal member. As is discussed herein before, it is submitted that the primary reference fails to anticipate the subject matter of Claim 1 from which Claim 8 depends. It is respectfully submitted that the subject matter of claim 8, when considered in the environment of its parent Claim 1, is patentably distinct over the art and in compliance with the requirements of 35 USC § 103.

Claim 11 has been rejected on a combination of the primary reference of Hiroshi when taken in view of the Hardt US Patent No. 4,328,905. It is respectfully submitted that Claim 11 as now presented as dependent upon amended Claim 1, is patentably distinct over the references. It is submitted that the primary reference does not disclose the container as claimed and thus fails as a primary reference upon which the teachings of the secondary reference may be applied. Thus, reconsideration and allowance of Claims 8 and 11, when considered under the standards of 35 USC § 103, are requested.

Applicant requests a two month extension of time to respond to this Office Action and our check in the amount of \$390.00 is enclosed for that purpose. Any extension of time that may be needed in the future with respect to any action in this case is hereby generally requested in advance. The Commissioner is authorized to deduct any amount due with respect to an extension of time Deposit Account No. 16-2230 or credit any overpayment of any fees to same.

July 30, 2001

  
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MARKED UP CLAIMS TO SHOW CHANGES

Please cancel claims 2, 5 and 7 and amend the retaining claims 1-4, 6 and 8-18 as follows, a marked up set of the claims is appended hereto.

1. (Amended) A container [assembly comprising] closure for an open-ended container [and a closure system therefor including] comprising:

- (i) a flexible membrane for closing the open end of the container;
- (ii) a seal disposed to lie, in use of the closure between the flexible membrane and [the] a container;
- (iii) a rigid cap having a resiliently deformable member juxtaposed to the fleximbe membrane in use of the closure [mounted on the container having a resiliently deformable member juxtaposed to the flexible membrane], the resiliently deformable member in use pressing the flexible membrane against the container in the vicinity of the seal, thereby reinforcing the seal sufficiently to withstand pressures generated on heating of the contents of the container;

wherein, the rigid cap includes one of a cam and follower pair engageable in use of the closure with the other of a cam and follower pair on a said container, including a neck, that is closeable by the closure relative movement between the cam and follower in a predetermined direction causing the rigid cap and the container neck to approach one another, thereby increasing the pressure exerted by the resiliently deformable member on the flexible membrane,

the rigid cap further including a laminar member and an annular skirt depending downwardly therefrom, the cam or the follower being secured on the upper wall of the skirt,

and wherein the laminar member is spaced from the flexible membrane by a distance less than the maximum possible extension of the resiliently deformable member towards the laminar member.

3. (Amended) A container [assembly] closure according to Claim 1 [2] wherein the cam and follower include co-operating screw threads formed respectively on the container and the rigid [closure] cap.

4. (Amended) A container [assembly] closure according to any preceding claim shaped to close a container, including [wherein the container includes] a neck having an annular flange for defining part of the said seal, the resiliently deformable [resilient] member being in use of the

closure substantially congruent with the flange whereby the resilient member passes the flexible membrane against the flange.

6. (Amended) A container [assembly] closure according the Claim [5] 1 wherein the laminar member is a circular disc, the skirt depending from the outer periphery thereof.

8. (Twice Amended) A container [assembly] closure according to Claim 1 wherein the resiliently deformable member comprises a foamed material secured to the rigid [closure] cap.

9. (Twice Amended) A container closure according to Claim 1 wherein the flexible membrane comprises a metal foil [or a plastic film with a functional barrier layer] adhesively [secured] securable on the container neck.

10. (Twice Amended) A container [assembly] closure according to [an of] Claim 4 wherein the closure is shaped for use with a [the container neck is] generally cylindrical container neck.

11. (Twice Amended) A container [assembly] closure according to Claim 1 including a lifting tab hingeably secured to the flexible membrane by the same material as that of the flexible membrane.

12. (Twice Amended) A container [assembly] closure according to Claim 1 in which the container is a metal[, plastic] or composite can.

13. (Amended) A container [assembly] closure according to Claim 12 wherein the rigid cap supports [of] the body of the can in a radial direction.

14. (Amended) A method of [forming] closing a container [assembly] with a closure according to Claim [2] 1 comprising the steps of:

(i) adhesively securing a said flexible membrane on the open end of a neck of the container [by use of adhesives or heat-sealing], thereby forming a said seal;

(ii) engaging the can and follower of a said rigid [closure] cap and the container neck with one another; and

(iii) moving the rigid [closure] cap and the container neck relative to one another to cause relative movement between the cam and the follower in the predetermined direction, thereby causing the resiliently deformable member to press the flexible membrane against the container in the vicinity of the seal sufficiently to maintain the seal against pressures generated in the container on heating of its contents.

16. (Amended) A method according to Claim 14 wherein the step of moving the rigid [closure] cap and the container neck relative to one another includes rotating the rigid [closure] cap and the container relative to one another.

17. (Twice Amended) A method according to Claim [16] 14 wherein [the container has a neck and wherein] the step of adhesively securing the flexible membrane on the open end of the container neck includes the sub steps of applying adhesive material to the flexible membrane and/or the container neck; engaging the flexible membrane and the container neck with one another to define the seal; and curing the adhesive material.

18. A method according to Claim 17 wherein the substep of curing the adhesive material includes heating thereof.

IN THE SPECIFICATION

Page 9, second paragraph:

The closure of the open end of can 10 includes a rigid cap 12 comprising a circular disc 21 having a cylindrical, annular skirt 22 depending downwardly therefrom. The rigid cap supports the body of the can in a radial direction.

Page 11, second paragraph:

A preferred method of packing a food product in accordance with the invention includes placing food products in an open ended can 10 one end 27 of which is sealed (by virtue of manufacture of the can body as a two-piece body sealed at one end) by a closure to provide a container assembly according to the invention. If appropriate, a suitable modified atmosphere may be added above the level of the food product in the can 10 by conventional apparatus; and then a conventional can end 28 may be secured in a *per se* known manner by a "flanger", ie a double seaming machine.

Page 11, third paragraph:

Before cooking of the food products, and preferably before the food products are placed in the can, a cap 12 is screwed into the threads 19 of [30 the closure of the invention] body portion 13b again by machine or by hand as appropriate and tightened down onto the end of can 10 until annular member 24 presses membrane 11 against flange 18 with a predetermined pressure. The moment prior to contact between the components is shown in Figure 3. The predetermined pressure may be achieved eg. by sensing the torque necessary to rotate cap 12 onto the threads 19.

Page 12, second paragraph:

The action of annular member 24 ensures that the peripheral seal of membrane 11 is strong enough to withstand the additional pressures generated during cooking. The laminar member is spaced from the flexible membrane by a distance less than the maximum possible extension of the flexible member towards the laminar member. The presence of disc 21 prevents rupture of membrane 11 at locations spaced from flange 18.



ABSTRACT

-- An open ended can has both a flexible member closure and a rigid closure, the flexible member closure being of the easy-open type secured across the open end of the can, the rigid closure being a rigid, screw cap screwed over the sealed end of the can. An annular resilient member depending downwardly from the underside of the end wall of the cap engages the membrane in the vicinity of the end flange of the can body thereby strengthening the seal between the membrane and the flange. Cooking the contents of the can with the flexible membrane in situ is accomplished with the rigid cap in place, thereby giving rise to a can having an easy-open end, the contents of which can be cooked and sterilized using conventional processing. --